OBSERVATIONS ON THE RESPONSE OF QUEENSLAND DANAID BUTTERFLIES TO SELECTIVE ATTRACTANTS

By A. F. Atkins

Flat 1, 15 Booker Street, North Rockhampton, Queensland, 4701.

Male butterflies of the subfamily Danainae have a pair of expansible, pheromone-disseminating organs (hairpencils) near the tip of the abdomen. When expanded the hairpencils give off a characteristic scent. Edgar *et al.* (1971, 1973) have found that several danaids from Australia and the New Hebrides secrete on their hairpencils dihydropyrrolizines which are chemically related to the pyrrolizidine alkaloids. There is evidence to suggest (Edgar *et al.,* 1973) that the male butterflies obtain their hairpencil dihydropyrrolizines from pyrrolizidine alkaloid-containing plants by adult feeding.

Danaid butterflies are strongly attracted to, and feed on, certain withered and dead pyrrolizidine alkaloid-containing plants. Reports of this attraction are well documented. Hopkins and Buxton (1926), Poulton (1936) and Lever (1936) reported attraction of danaids to the tree *Tournefortia argentea* L. (Family Boraginaceae). Species of *Heliotropium* and other plants of the Boraginaceae which contain pyrrolizidine alkaloids are also reported to attract danaids (Beebe, 1955; Edgar *et al.,* 1973). In these reports it was generally observed that male butterflies attended these plants, though Lever recorded female danaids feeding from broken branches and withered leaves of *Tournefortia.* I report here my own observations of the specific attraction of danaids to certain plants.

In central Queensland the species *Euploea core corinna* (W. S. Macleay), *Euploea tulliolus tulliolus* (Fabricius), *Danaus plexippus plexippus* (Linnaeus), *Danaus chryippus petila* (Stoll), and *Danaus hamatus hamatus* (W. S. Macleay) are abundant in the butterfly fauna. In the warmer months flights of apparently migrating *E. core, D. hamatus,* and to a lesser extent *E. tulliolus,* occur. During the heat of the day large numbers of these danaids congregate in darkly shaded gullies where they rest on over-hanging leafless branches.

In 1970 I received samples of dried *Heliotropium amplexicaule* Vahl and these were tested as a lure in 'cluster' areas near Rockhampton in central Queensland. Although the tests were conducted only briefly during poor weather, the plants noticeably attracted the danaids.

Further observations in 1971, 1972, and 1973 at Mt. Archer (Rockhampton), Edungalba and Expedition Range (west of Rockhampton) revealed three significant selective plant attractants growing in these central Queensland areas. The first, an unidentified species of *Heliotropium,* attracted *D. hamatus,* particularly when this plant grew in shaded gullies near cluster areas. The second was a rattlepod, *Crotalaria spectabilis* Roth. which attracted large numbers of *D. hamatus,* and *E. core,* and a few *E. tulliolus.* Another rattlepod, *Crotalaria lanceolata* E. Meyer, also attracted moderate numbers of *D. plexippus* and *D. chrysippus.* Both rattlepods attracted danaids only when found growing in shaded areas or on sheltered slopes. Several species of *Crotalaria* growing in more

PLATE I

Queensland danaid butterflies attracted to the rattlepod, *Crotalaria spectabilis* Roth. *Euploea core corinna* (W. S. Macleay), with haustellum inserted in a seed-pod, through the emergence hole excavated by a lycaenid larva. *Danaus hamatus hamatus* (W. S. Macleay), feeding from a rib of a withered leaf. *Euplea tulliolus tulliolus* (Fabricius), feeding from the stem of the rattlepod.

exposed situations were rarely visited. A third attractant, *Parsonia straminea* (R.Br.) F. Muell. was commonly attended by *D. hamatus* and occasionally by *E. tulliolus*.

In each observation, both sexes were found to be attracted to the plants, though males greatly out-numbered females. This dominance of males was also apparent in clustering populations of *D. hamatus* and *E. core*. The butterflies attending the plants were reluctant to leave and some specimens remained feeding for more than an hour. When disturbed they would fly a short distance, then quickly return to the plant. The danaids were particularly attracted to the mature growth or withered parts of the stem, leaves and leaf ribs. In each the haustellum was uncoiled and extended to the plant surface in a feeding position. Those feeding on *Crotalaria* were often seen to attend the dried pods. On one occasion all five danaids were observed on the freshly exposed roots of *Parsonia*.

All previous reports of danaids feeding at the dead and withering parts of plants have been confined to species of the family Boraginaceae. My observation of butterflies apparently feeding at *Crotalaria* appears to be the first report of attraction to pyrrolizidine alkaloid-containing legumes of the family Papilionaceae.

Parsonia straminea is not known to contain pyrrolizidine alkaloids and the reason the butterflies are attracted to this plant deserves investigation.

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